## Washington State Shellfish and Marine Biotoxin Program

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### Marine Riotoxins in WA

Mainic Diotoxins in WA					
	Paralytic Shellfish Poisoning (PSP)	Amnesic Shellfish Poisoning (ASP)	Diarrhetic Shellfish Poisoning		







Caused by: Dinoflagellate Alexandrium catenella

Diatom Pseudo-nitzschia





Saxitoxin

**Toxin Produced:** (Neurotoxin)

**Domoic Acid** (Neurotoxin)

Okadaic Acid

1991

2012

≥20 ppm in tissue  $\geq$ 16 µg/100g tissue

#### 2007 Sentinel Biotoxin Mussel Sites Bellingham Washington State Vancouver Island Canada Mussel Sampling Sites Aberdeen 49 Port Orchard Marina Birch Bay Village 26 Mystery Bay 50 Southworth Ferry Dod 27 Sequim Bay St Park 51 Point Vashon Fossil Bay 52 Glen- Ayr Canal Resor West Beach Cove 29 Oak Bay County Park 53 Tramp Harbor 54 Des Moines Marina 30 Discovery Bay Condos 55 Burley Lagoon 8 Shoal Bay 32 Mats Mats Bay 56 Allyn 9 Friday Harbor 33 Port Ludlow Marina 57 Dockton 10 Crandell Spit 34 Second Beach 58 Union 11 Mud Ray/Lopez 35 Squamish Harbor 59 Point Defiance Marina 36 Port Gamble 12 Cattle Point 60 Horse Head Ray 13 Barlow Bay 37 Lofall 61 Jarrell Cove 14 Cornet Ray 38 Edmonds Marina 62 Wollochet Bay 63 Penrose Point Park 15 Neah Bay 39 Kingston Marina 16 Mukkaw Ray 64 Day Island Marina 40 Quilcene Ray 41 Miller Bay 65 Filucy Bay 17 Sekiu Point 18 Penn Cove 42 Poulsho Marin 66 Steilacoom Dock 19 Pillar Point 43 Shilshole Bay 67 Zittel's Marina 20 Freshwater Bar 44 Rrownsville 68 Roston Harbor Marina 21 Ediz Hook 45 Silverdale 46 Seabeck Marina 47 Port Washington Marina 71 Bay Center Dock

# Sentinel Mussel Monitoring Program (started 1990)

#### Mission:

- Provides an early-warning system for
- PSP/ASP/DSP toxin levels.

#### **Scope of Program:**

- ~70-80 sites.
- Sampled biweekly (seasonally)
- Coordinated effort among DOH staff, DFW, DNR, local health, tribes, industry and citizen volunteers.



## Sentinel Mussel Cage







## June 25, 2011 – DSP Illness Sequim Bay State Park

#### Collection:

- Mussels harvested from underside of public dock at Sequim Bay St. Park
- Boiled for 10 minutes and consumed

#### Sickness:

- 1 adult, 2 children became ill within 2-4 hours of consumption
- Signs and symptoms: nausea, vomiting, cramps, diarrhea, subjective fever, chills, body aches
- Symptoms continued for 15–96 hours



## DSP in Washington

#### 2015

- 9 Recreation Closures
- 2,507 samples analyzed
  - 22samples ≥16µg/100g DSP toxins
  - 157μg/100g in Liberty Bay 9/14/15 in Blue Mussels
- Dual HAB Closure Events (DSP and PSP)

2014:10 recreational closures





#### Waterbodies above DSP closure levels in 2015

Location	µg/100g tissue	Sample Date
Liberty Bay	157	9/14
Sequim Bay *	43	6/9
Budd Inlet **	43	11/19
Pitt Passage	21	9/3
Bellingham Bay *	19	7/6
Discovery Bay *	16	7/1

Action Level:  $\geq$ 16  $\mu$ g / 100g tissue

- \* Had DSP over the action level in 2014
- \*\* Area still closed due to elevated DSP toxin

## DSP from 2012–2015 in WA

	2012	2013	2014	2015
Total Samples Tested for DSP	877	1927	2128	2507
# Samples >16μg DSP	87	21	92	22
Highest DSP Levels of the Year	184µg	50μg	180µg	157μg
County	Whatcom	San Juan	Clallam	Kitsap
Species	Blue Mussels	Blue Mussels	Blue Mussels	Blue Mussels



## **Questions?**

http://www.doh.wa.gov/CommunityandEnvironment/Shellfish



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